UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,118	03/10/2004	Shigekazu Harada	00380377AA	2471

30743 7590 09/07/2007
WHITHAM, CURTIS & CHRISTOFFERSON & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

EXAMINER	
LIU, LI	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
09/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/796,118	HARADA, SHIGEKAZU	
	Examiner	Art Unit	
	Li Liu	2613	

A

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claim 13 is objected to because of the following informalities: claim 13, lines 5-6, "wavelength determining means that determines wavelength determining means that determines" should be changed to -- wavelength determining means that determines --. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 8, 10, 13, 15 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al (US 2001/0004290).

1). With regard to claims 1 and 13, Lee et al discloses a wavelength division multiplexing transmission system or a remote apparatus in a wavelength division multiplexing transmission system (Figures 4a and 4b) in which a plurality of remote apparatuses (the Optical Network Unit in Figures 4a and 4b) are

connected to a station apparatus (the Central Office in Figure 4) and communication is performed among said remote apparatuses and the station apparatus (Figure 4, the communication is performed between the central office and the optical network units), wherein each of said remote apparatuses comprises wavelength determining means (Figures 4, the F-P LD) that determines an available wavelength on the basis of an optical signal received from said station apparatus (the optical network units receives the injected light signal, and the F-P laser diode is locked by the injected light, and then the F-P LD outputs the wavelength identical to the wavelength of the injected light. [0073], "the output wavelength of each F-P LD is **automatically** aligned to the pass-band of the (de)multiplexer in remote node since the output wavelength of the F-P LD is locked by the injected incoherent light". That is, the F-P LD **automatically** determines an available wavelength on the basis of an optical signal received from said station apparatus).

2). With regard to claim 3, Lee et al discloses wherein said wavelength determining means determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus ([0073], "the output wavelength of each F-P LD is automatically aligned to the pass-band of the (de)multiplexer in remote node since the output wavelength of the F-P LD is locked by the injected incoherent light". That is, the F-P LD determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus).

3). With regard to claim 8 and 10, Lee et al discloses wherein each of said remote apparatuses and said station apparatus are connected with each other through optical branching and coupling means (Figure 4a, the D/MUX), and wherein said optical branching and coupling means is wavelength demultiplexing and multiplexing means (Figure 4a, the D/MUX).

4). With regard to claim 15, Lee et al discloses wherein said wavelength determining means determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength ([0073], "the output wavelength of each F-P LD is automatically aligned to the pass-band of the (de)multiplexer in remote node since the output wavelength of the F-P LD is locked by the injected incoherent light". That is, the F-P LD determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus).

5). With regard to claim 20, Lee et al discloses a method for adding a remote apparatus to a wavelength division multiplexing transmission system (Figures 4a and 4b) in which a plurality of remote apparatuses (the Optical Network Unit in Figures 4a and 4b) are connected to the station apparatus and communication is performed among said remote apparatuses and the station apparatus (Figure 4, the communication is performed between the central office and the optical network units), wherein an available wavelength is determined on the basis of an optical signal received at a remote apparatus to be added and the wavelength is set as a transmission and reception wavelength to be used in said

remote apparatus to be added (the optical network units receives the injected light signal, and the F-P laser diode is locked by the injected light, and then the F-P LD outputs the wavelength identical to the wavelength of the injected light. [0073], "the output wavelength of each F-P LD is **automatically** aligned to the pass-band of the (de)multiplexer in remote node since the output wavelength of the F-P LD is locked by the injected incoherent light". That is, the F-P LD **automatically** determines an available wavelength on the basis of an optical signal received from said station apparatus).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 6, 8-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (AAPA: Figure1 and the Background of the Invention) in view of Majima (US 6,101,014).

1). With regard to claim 1, the admitted prior art discloses a wavelength division multiplexing transmission system (Figure 1) in which a plurality of remote apparatuses (20-1 to 20-m in Figure 1) are connected to a station apparatus (10 in Figure 1) and communication (Background of the Invention) is performed among said remote apparatuses and the station apparatus, wherein each of said

remote apparatuses comprises wavelength determining means (Wavelength Controller 240-1 to 240-m in Figure 1) that determines an available wavelength.

But, the admitted prior art does not discloses that the wavelength determining means determines an available wavelength on the basis of an optical signal received from said station apparatus.

However, Majima teaches a system and method (Figure 4 and Figure 5) in which the wavelength determining means (Figure 5, the Wavelength Control System and tunable filter and light receiving element etc.) determines an available wavelength on the basis of an optical signal received from said station apparatus (Figure 1 shows the existing wavelengths and the wavelength that will be added (the dotted line)). The transmitting terminal station controls the wavelength tunable optical transmitter such that the transmitter transmits light of a wavelength which is not being used on the network communication transmission line. Majima's method also can be carried out such that the delivery of the output light from the light-emitting means to the transmitting line is prohibited until the wavelength of the output light is set not to interfere with the other light. Thus, the delivery of the output light is controlled to avoid any interference which otherwise may be caused by delivering light of a wavelength which risks interference (column 4, line 30-47). As shown in FIG. 2A, Majima's method conducts detection of the wavelength disposition on the optical fiber transmission line of the network system. The transmissive wavelength range of the tunable optical filter 502 is swept, thereby detecting disposition of existing

wavelengths. Ref to Figures 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set.

As disclosed by the AAPA, for a conventional system, each time a new remote apparatus is installed, a wavelength to be used in that system must be set by a maintainer or other personnel. And collisions between signals may occur and action must be taken to handle them.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the method and system of autonomously controlling and setting of an available wavelength as taught by Majima to the system of applicant admitted prior art so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information, and then no man-hours are required while a new remote apparatus is added or updated.

2). With regard to claim 2, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. And the AAPA and Majima further disclose wherein said wavelength determining means determines the wavelength of an unreceived optical signal among the wavelength classification used with said transmission system as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus (Majima: Figure 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set).

3). With regard to claim 3, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. But, the AAPA and Majima does not expressly disclose wherein said wavelength determining means determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus.

In Figure 4 of Majima, a star coupler is used so that the optical node receives all existing wavelength, then the optical node must determine an unused wavelength. However, as disclosed by the AAPA, a wavelength demultiplexer can be used to separate the wavelengths from the station apparatus 10, and each remote apparatus (e.g., 20-1) only receives one wavelength. Therefore, it is obvious to one skilled in the art to configure the wavelength controller so that the wavelength determining means determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus.

4). With regard to claim 6, the AAPA and Majima discloses all of the subject matter as applied to claim 1 above. And the AAPA and Majima further disclose wherein said wavelength determining means comprises:

wavelength filtering means (Majima: tunable optical filter 503 in Figure 5) that sequentially separates optical signals from an optical signal including a plurality of wavelengths;

optical receiving means (Majima: light receiving element 506 in Figure 5) that outputs a reception status signal indicating whether or not said separated optical signal is being received;

wavelength control means (Majima: wavelength control system in Figure 5) that determines an unused wavelength among the wavelength classification used with said transmission system on the basis of said reception status signal, sets said unused wavelength as a transmission and reception signal, and outputs a wavelength control signal (e.g, the tunable LD control voltage VL etc) for setting said wavelength; and

optical transmitting means (Majima: tunable LD 502 in Figure 5) whose output wavelength is adjusted to be said unused wavelength in response to said wavelength control signal.

5). With regard to claim 8, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. And the AAPA and Majima further disclose wherein each of said remote apparatuses and said station apparatus are connected with each other through optical branching and coupling means (7 and 8 in Figure 1 of the AAPA, or the star coupler in Figure 4 of Majima).

6). With regard to claim 9, the AAPA and Majima disclose all of the subject matter as applied to claims 1 and 8 above. And the AAPA and Majima further disclose wherein said optical branching and coupling means is an optical coupler (the star coupler in Figure 4 of Majima).

7). With regard to claim 10, the AAPA and Majima disclose all of the subject matter as applied to claims 1 and 8 above. And the AAPA and Majima

further disclose wherein said optical branching and coupling means is wavelength demultiplexing and multiplexing means (7 and 8 in Figure 1 of the AAPA).

8). With regard to claim 11, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. And the AAPA and Majima further disclose wherein said plurality of remote apparatuses and said station apparatus are connected in a star topology (Figure 1 of the admitted prior is a star topology, page 2 line 9, and Figure 4 of Majima).

9). With regard to claim 12, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. But, the AAPA and Majima do not expressly disclose wherein said plurality of remote apparatuses and said station apparatus are connected in a tree topology.

However, as the applicant state a tree system is just a configuration in which a number of remote apparatuses are connected to each other through a relay point such as a star coupler (page 1, line 17-20). So, the tree topology is just adding another "star" configuration to a star configuration. Therefore, Claim 12 is not patentable different from the star topology in admitted prior art in view of Majima, because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

10). With regard to claim 13, the admitted prior art discloses a remote apparatus (20-1 to 20-m in Figure 1) in a wavelength division multiplexing transmission system (Figure 1) in which a plurality of remote apparatuses are connected to a station apparatus (10 in Figure 1) and communication is

performed among said remote apparatuses and the station apparatus (Background of the Invention), said remote apparatus comprising wavelength determining means that determines wavelength determining means (Wavelength Controller 240-1 to 240-m in Figure 1) that determines an available wavelength.

But, the admitted prior art does not discloses that the wavelength determining means determines an available wavelength on the basis of an optical signal received from said station apparatus.

However, Majima teaches a system and method (Figure 4 and Figure 5) in which the wavelength determining means (Figure 5, the Wavelength Control System and tunable filter and light receiving element etc.) determines an available wavelength on the basis of an optical signal received from said station apparatus (Figure 1 shows the existing wavelengths and the wavelength that will be added (the dot line)). The transmitting terminal station controls the wavelength tunable optical transmitter such that the transmitter transmits light of a wavelength which is not being used on the network communication transmission line. Majima's method also can be carried out such that the delivery of the output light from the light-emitting means to the transmitting line is prohibited until the wavelength of the output light is set not to interfere with the other light. Thus, the delivery of the output light is controlled to avoid any interference which otherwise may be caused by delivering light of a wavelength which risks interference (column 4, line 30-47). As shown in FIG. 2A, Majima's method conducts detection of the wavelength disposition on the optical fiber transmission line of the network system. The transmissive wavelength range of the tunable optical

filter 502 is swept, thereby detecting disposition of existing wavelengths. Refer to Figures 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set.

As disclosed by the AAPA, for a conventional system, each time a new remote apparatus is installed, a wavelength to be used in that system must be set by a maintainer or other personnel. And collisions between signals may occur and action must be taken to handle them.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the method and system of autonomously controlling and setting of an available wavelength as taught by Majima to the system of applicant admitted prior art so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information, and then no man-hours are required while a new remote apparatus is added or updated.

11). With regard to claim 14, the AAPA and Majima discloses all of the subject matter as applied to claim 13 above. And the AAPA and Majima further disclose wherein said wavelength determining means determines the wavelength of an unreceived optical signal among the wavelength classification used with said transmission system as the available wavelength and sets the wavelength as a transmission and reception wavelength (Majima: Figure 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set).

12). With regard to claim 15, the AAPA and Majima discloses all of the subject matter as applied to claim 13 above. But, the AAPA and Majima does not expressly disclose wherein said wavelength determining means determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus.

In Figure 4 of Majima, a star coupler is used so that the optical node receives all existing wavelength, then the optical node must determine an unused wavelength. However, as disclosed by the AAPA, a wavelength demultiplexer can be used to separate the wavelengths from the station apparatus 10, and each remote apparatus (e.g., 20-1) only receives one wavelength. Therefore, it is obvious to one skilled in the art to configure the wavelength controller so that the wavelength determining means determines the wavelength of a received optical signal as the available wavelength and sets the wavelength as a transmission and reception wavelength to be used in said remote apparatus.

13). With regard to claim 16, the AAPA and Majima discloses all of the subject matter as applied to claim 13 above. And the AAPA and Majima further disclose wherein said wavelength determining means comprises:

wavelength separating means (Majima: tunable optical filter 503 in Figure 5) that sequentially separates optical signals from an optical signal including a plurality of wavelengths;

optical receiving means (Majima: light receiving element 506 in Figure 5) that outputs a reception status signal indicating whether or not said separated optical signal is being received;

wavelength control means (Majima: wavelength control system in Figure 5) that determines an unused wavelength among the wavelength classification used with said transmission system on the basis of said reception status signal, sets said unused wavelength as a transmission and reception signal, and outputs a wavelength control signal (e.g, the tunable LD control voltage VL etc) for setting said wavelength; and

optical transmitting means (Majima: tunable LD 502 in Figure 5) whose output wavelength is adjusted to be said unused wavelength in response to said wavelength control signal.

12). With regard to claim 20, the AAPA discloses a method for adding a remote apparatus (page 3 line 12-190 to a wavelength division multiplexing transmission system (Figure 1) in which a plurality of remote apparatuses (20-1 to 20-m in Figure 1) are connected to the station apparatus (10 in Figure 1) and communication is performed among said remote apparatuses and the station apparatus (Background of the Invention).

The admitted prior discloses a wavelength determining means (Wavelength Controller 240-1 to 240-m in Figure 1) that determines an available wavelength. But, the admitted prior art does not discloses wherein an available wavelength is determined on the basis of an optical signal received at a remote

apparatus to be added and the wavelength is set as a transmission and reception wavelength to be used in said remote apparatus to be added.

However, Majima teaches a system and method (Figure 4 and Figure 5) in which the wavelength determining means (Figure 5, the Wavelength Control System and tunable filter and light receiving element etc.) determines an available wavelength on the basis of an optical signal received from said station apparatus (Figure 1 shows the existing wavelengths and the wavelength that will be added (the dot line)). The transmitting terminal station controls the wavelength tunable optical transmitter such that the transmitter transmits light of a wavelength which is not being used on the network communication transmission line. Majima's method also can be carried out such that the delivery of the output light from the light-emitting means to the transmitting line is prohibited until the wavelength of the output light is set not to interfere with the other light. Thus, the delivery of the output light is controlled to avoid any interference which otherwise may be caused by delivering light of a wavelength which risks interference (column 4, line 30-47). As shown in FIG. 2A, Majima's method conducts detection of the wavelength disposition on the optical fiber transmission line of the network system. The transmissive wavelength range of the tunable optical filter 502 is swept, thereby detecting disposition of existing wavelengths. Refer to Figures 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set.

As disclosed by the AAPA, for a conventional system, each time a new remote apparatus is installed, a wavelength to be used in that system must be

set by a maintainer or other personnel. And collisions between signals may occur and action must be taken to handle them.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the method and system of autonomously controlling and setting of an available wavelength as taught by Majima to the system of applicant admitted prior art so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information, and then no man-hours are required while a new remote apparatus is added or updated.

7. Claims 4, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (AAPA: Figure1 and the Background of the Invention) and Majima (US 6,101,014) as applied to claim 1 above, and in further view of Miyazaki et al (US 2003/0118280).

1). With regard to claims 4 and 5, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. But the AAPA and Majima do not expressly teach wherein said station apparatus comprises optical output control means that determines a wavelength to be used, on the basis of an optical signal received from said remote apparatus; and wherein said station apparatus prevents an optical signal having the same wavelength as an unreceived wavelength from being outputted and outputting and optical signal having the same wavelength as a received wavelength.

The AAPA and Majima disclose a wavelength control means based on a received signal at the remote node, and teach wherein the remote apparatus prevents an optical signal having the same wavelength as an unreceived wavelength from being outputted and outputting and optical signal having the same wavelength as a received wavelength (Majima: the delivery of the output light is controlled to avoid any interference which otherwise may be caused by delivering light of a wavelength which risks interference, column 4, line 30-47. As shown in FIG. 2A, Majima's method conducts detection of the wavelength disposition on the optical fiber transmission line of the network system. The transmissive wavelength range of the tunable optical filter 502 is swept, thereby detecting disposition of existing wavelengths. Refer to Figures 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use another wavelength control means at the station side. By using the wavelength control means at the station side, the wavelength desired by the remote node can be conveniently obtained, and then, the station apparatus can prevent the optical signal having the same wavelength as an unreceived wavelength from being outputted and outputting and optical signal having the same wavelength as a received wavelength. Claims 4 and 5 are not patentable different from the wavelength controller in admitted prior art in view of Majima because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Also another prior art, Miyazaki et al, teaches a wavelength controller (the wavelength controller in Figures 1 and 3) at the central station so that the wavelength of the laser 16 is set to a correct position based on the signal from the remote apparatus (40 in Figures 1and 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the wavelength controller as taught by Miyazaki et al to the system of the AAPA and Majima so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information.

2). With regard to claim 7, the AAPA and Majima disclose all of the subject matter as applied to claim 1 above. And the the AAPA and Majima further discloses wherein said station apparatus comprises:

wavelength demultiplexing means (4 in Figure 1 of the AAPA) that demultiplexes the wavelength of a received optical signal;

optical receiving means (Optical Receiver 111 – 11n in Figure 1 of the AAPA) that receives an optical signal demultiplexed by said wavelength demultiplexing means;

optical transmitting means (Optical Transmitter 101 – 10n in Figure 1 of the AAPA) that transmits an optical signal having the transmission wavelength determined by said optical output control means; and

wavelength multiplexing means (3 in Figure 1 of the AAPA) that multiplexes the wavelength of the optical signal transmitted by said optical transmitting means.

But, the admitted prior art does not discloses optical output control means that determines, as a transmission wavelength, an optical signal having the same wavelength as that of an optical signal received by said optical receiving means;

However, the AAPA and Majima disclose a wavelength control means based on a received signal at the remote node. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use another wavelength control means at the station side. By using the wavelength control means at the station side, the wavelength desired by the remote node can be conveniently obtained. Claim 7 is not patentable different from the wavelength controller in admitted prior art in view of Majima, because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Also another prior art, Miyazaki et al, teaches a wavelength controller (the wavelength controller in Figures 1 and 3) at the central station so that the wavelength of the laser 16 is set to a correct position based on the signal from the remote apparatus (40 in Figures 1and 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the wavelength controller as taught by Miyazaki et al to the system of the AAPA and Majima so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information.

8. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (AAPA: Figure1 and the Background of the Invention) in view of Majima (US 6,101,014) and Miyazaki et al (US 2003/0118280).

1). With regard to claim 17, the AAPA discloses a station apparatus (10 in Figure 1) in a wavelength division multiplexing transmission system in which a plurality of remote apparatuses (20-1 to 20-m in Figure 1) are connected to the station apparatus and communication is performed among said remote apparatuses and the station apparatus (Background of the Invention).

But, the AAPA does not discloses the station apparatus comprising optical output control means that determines a wavelength to be used, on the basis of an optical signal received from said remote apparatus.

However, Majima teaches a system and method (Figure 4 and Figure 5) in which the wavelength determining means (Figure 5, the Wavelength Control System and tunable filter and light receiving element etc.) determines an available wavelength on the basis of an optical signal received from said station apparatus (Figure 1 shows the existing wavelengths and the wavelength that will be added (the dot line)). The transmitting terminal station controls the wavelength tunable optical transmitter such that the transmitter transmits light of a wavelength which is not being used on the network communication transmission line. Majima's method also can be carried out such that the delivery of the output light from the light-emitting means to the transmitting line is prohibited until the wavelength of the output light is set not to interfere with the other light. Thus, the delivery of the output light is controlled to avoid any interference which otherwise

may be caused by delivering light of a wavelength which risks interference (column 4, line 30-47). As shown in FIG. 2A, Majima's method conducts detection of the wavelength disposition on the optical fiber transmission line of the network system. The transmissive wavelength range of the tunable optical filter 502 is swept, thereby detecting disposition of existing wavelengths. Refer to Figures 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set.

As disclosed by the AAPA, for a conventional system, each time a new remote apparatus is installed, a wavelength to be used in that system must be set by a maintainer or other personnel. And collisions between signals may occur and action must be taken to handle them.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the method and system of autonomously controlling and setting of an available wavelength as taught by Majima to the system of applicant admitted prior art so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information, and then no man-hours are required while a new remote apparatus is added or updated.

The AAPA and Majima disclose a wavelength control means based on a received signal at the remote node. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use another wavelength control means at the station side. By using the wavelength control

means at the station side, the wavelength desired by the remote node can be conveniently obtained. Claim 17 is not patentable different from the wavelength controller in admitted prior art in view Majima, because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Also another prior art, Miyazaki et al, teaches a wavelength controller (the wavelength controller in Figures 1 and 3) at the central station so that the wavelength of the laser 16 is set to a correct position based on the signal from the remote apparatus (40 in Figures 1and 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the wavelength controller as taught by Miyazaki et al to the system of the AAPA and Majima so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information.

2). With regard to claim 18, the AAPA and Majima and Miyazaki et al disclose all of the subject matter as applied to claim 17 above. But the AAPA wherein said station apparatus prevents an optical signal having the same wavelength as an unreceived wavelength from being outputted and outputting and optical signal having the same wavelength as a received wavelength.

The AAPA and Majima disclose a wavelength control means based on a received signal at the remote node, and teaches wherein the remote apparatus prevents an optical signal having the same wavelength as an unreceived wavelength from being outputted and outputting and optical signal having the

same wavelength as a received wavelength (Majima: the delivery of the output light is controlled to avoid any interference which otherwise may be caused by delivering light of a wavelength which risks interference, column 4, line 30-47. As shown in FIG. 2A, Majima's method conducts detection of the wavelength disposition on the optical fiber transmission line of the network system. The transmissive wavelength range of the tunable optical filter 502 is swept, thereby detecting disposition of existing wavelengths. Refer to Figures 1 and 2, wavelengths indicated by broken vertical lines are located as the candidates of the transmission wavelength to be set). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use another wavelength control means at the station side. By using the wavelength control means at the station side, the wavelength desired by the remote node can be conveniently obtained, and then, the station apparatus can prevent the optical signal having the same wavelength as an unreceived wavelength from being outputted and outputting and optical signal having the same wavelength as a received wavelength. Claim 18 is not patentable different from the wavelength controller in admitted prior art in view of Majima because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Also another prior art, Miyazaki et al, teaches a wavelength controller (the wavelength controller in Figures 1 and 3) at the central station so that the wavelength of the laser 16 is set to a correct position based on the signal from the remote apparatus (40 in Figures 1and 3). Therefore, it would have been

obvious to one of ordinary skill in the art at the time the invention was made to apply the wavelength controller as taught by Miyazaki et al to the system of the AAPA and Majima so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information.

3). With regard to claim 19, the AAPA and Majima and Miyazaki et al disclose all of the subject matter as applied to claim 17 above. And the AAPA further discloses the station apparatus, comprising:

wavelength demultiplexing means (4 in Figure 1 of the admitted prior) that demultiplexes the wavelength of a received optical signal;

optical receiving means (Optical Receiver 111 – 11n in Figure 1 of the admitted prior) that receives an optical signal demultiplexed by said wavelength demultiplexing means;

optical transmitting means (Optical Transmitter 101 – 10n in Figure 1 of the admitted prior) that transmits an optical signal having the transmission wavelength determined by said optical output control means; and

wavelength multiplexing means (3 in Figure 1 of the admitted prior) that multiplexes the wavelength of the optical signal transmitted by said optical transmitting means.

But, the AAPA does not discloses optical output control means that determines, as a transmission wavelength, an optical signal having the same wavelength as that of an optical signal received by said optical receiving means.

However, the AAPA and Majima and Miyazaki et al disclose a wavelength control means based on a received signal at the remote node. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use another wavelength control means at the station side. By using the wavelength control means at the station side, the wavelength desired by the remote node can be conveniently obtained. Claim 19 is not patentable different from the wavelength controller in admitted prior art in view of Majima, because it is "to duplicate a part for a multiple effect" (see St. Regis Paper Company v. Bemis Company, Inc., 193 USPQ 8 (CA 7 1977)).

Also another prior art, Miyazaki et al, teaches a wavelength controller (the wavelength controller in Figures 1 and 3) at the central station so that the wavelength of the laser 16 is set to a correct position based on the signal from the remote apparatus (40 in Figures 1and 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the wavelength controller as taught by Miyazaki et al to the system of the AAPA and Majima so that the controller can get the information from the receiver, and then desired wavelength for reception and transmitting can be easily and automatically selected based on the received information.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kubota et al (US 5,949,562).

Ogata (US 5,956,166).

Lee et al (US 2005/0163503) discloses a method and apparatuses to provide a WDM passive optical network based on wavelength-locked WDM light sources.

Williams et al (US 5,808,767) discloses a network has media access control functionality and utilizes a dynamic media access control procedure for allocation of the bandwidth.

Tsuruta (US 6,850,711) discloses a PON with a band setting control section and a use right transmitting section etc.

Tandon et al (US 5,774,244) discloses an optical network with PONs with function of dynamically selecting wavelength.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
September 3, 2007

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER